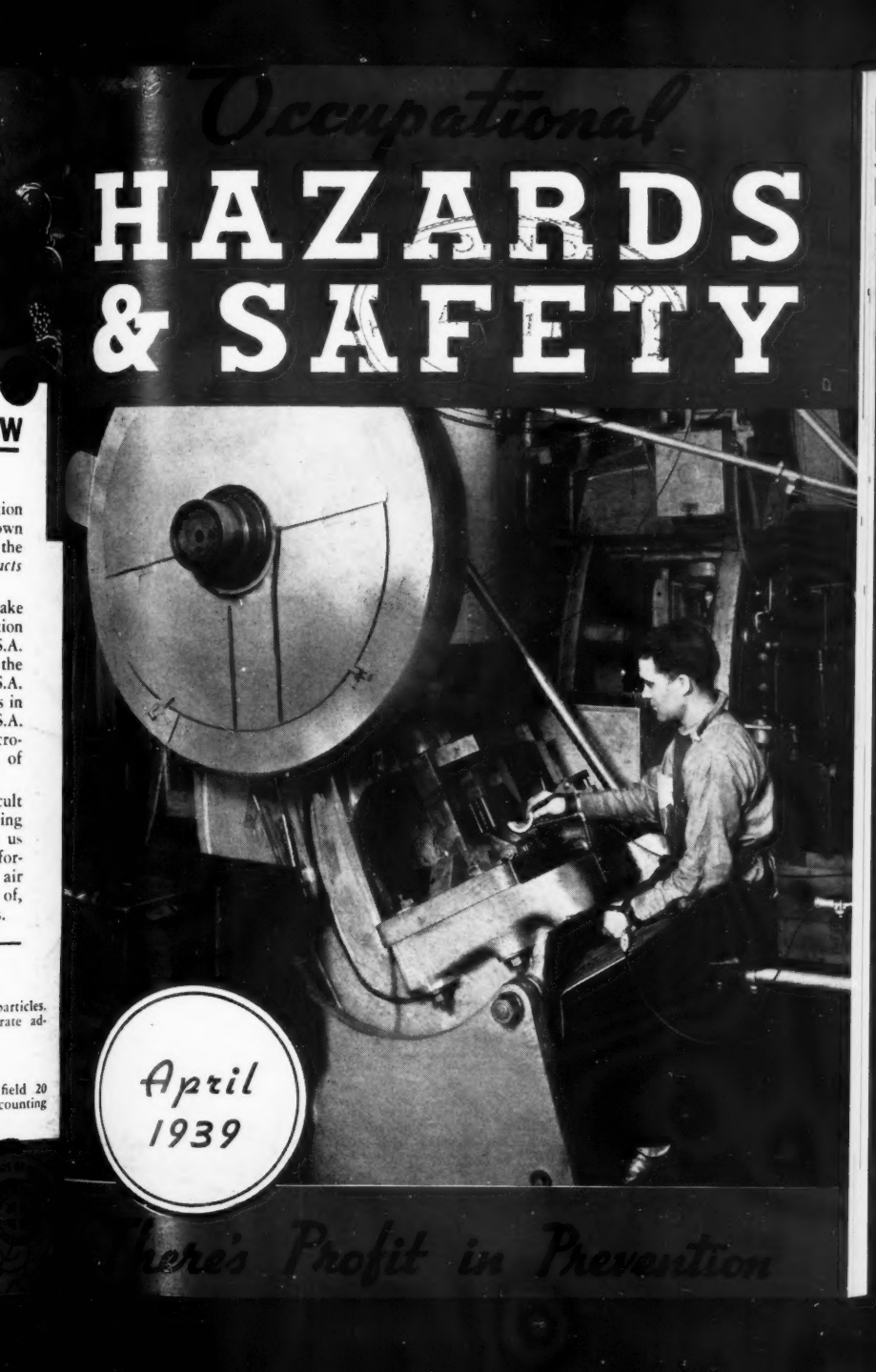
Occupational
HAZARDS
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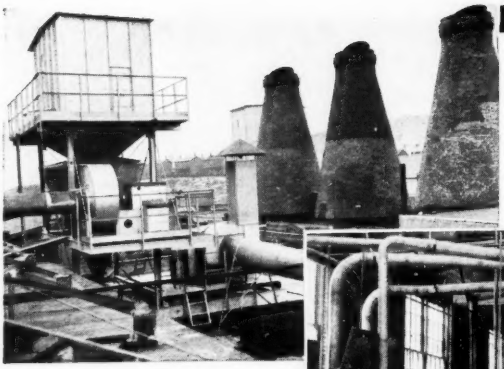
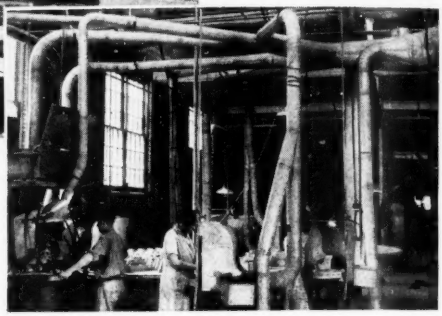
April
1939
There's Profit in Prevention

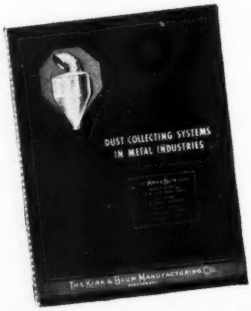


Views of Kirk & Blum installation at plant of large manufacturer of porcelain electrical insulators. System shown below removes dry clay dust and chips from drilling machine and seven other stations around the circular table.



BETTER DUST *and* FUME CONTROL

KIRK & BLUM Dust Control Systems and Fume Removal Systems are scientifically designed and specially constructed to reduce the dust and fume menace . . . to keep the air throughout the plant cleaner, healthier with utmost economy. Increase production—insure a better product—cut plant maintenance costs—save on insurance rates.



Our Engineers will make a study of your dust and fume removal problems, and explain how to overcome them efficiently and economically. Details of this service on request. Send for book of valuable information.

THE KIRK & BLUM MFG. COMPANY
2802 Spring Grove Avenue Cincinnati, Ohio
Chicago Representative: C. P. Gulon, 1661 N. Milwaukee
Pittsburgh: The Bushnell Mchy. Co., 311 Ross Street
Louisville: Liberty Eng. & Mfg. Co., Inc., 1450 S. 15th St.

KIRK & BLUM
DUST CONTROL SYSTEMS

EXECUTIVE OFFICE CORRESPONDENCE

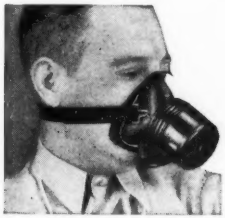
TO:

ALL SUPERVISORS: CUT COSTS through Accident Prevention

There's PROFIT IN WILLSON Protection

Style WV1

Spectacle Type Goggle, with Willson Wide View Super-Tough Flat Lenses, available with rocker nose pads or with broad saddle bridge; also, with or without sideshields in regular size, or small size for women and men with small features.



No. 200 Respirator

Approved by the U. S. Bureau of Mines for Type A Dusts. *No. 200L*, Officially Approved for Lead Dusts. Long life Rotiform filters. Mechanical Diaphragm exhalation valve.

Consult Authorized WILLSON Distributor Nearest You

Heavy taxation and mounting compensation costs make it mandatory to reduce operating expenses. Realizing the economic aspects of accident prevention, thousands upon thousands of industrial firms are now employing WILLSON Scientific Protection — the Quality Line of Industrial Safety Devices. There's Profit in WILLSON Protection!

REDUCE EYE INJURIES—Employ WILLSON Spectacle Type Goggles. Style WV1 herewith illustrated, is just one of the more than 300 types of goggles we manufacture. Recent Federal Government statistics show that the average direct cost of permanent and total eye disabilities in one division of industry in the State of Ohio is in excess of $1800 per injury—an amount more than sufficient to equip every worker in an average size plant with WILLSON Safety Goggles. Start cutting costs now! A WILLSON Safety Service Representative will show you how.

FIGHT SILICOSIS AND OTHER DUST HAZARDS—Guard your employees against this dread dust disease and eliminate costly compensation cases through the use of U. S. Bureau of Mines Approved WILLSON RESPIRATORS. Specify Rotiform Respirator No. 200 for TYPE A Dusts and No. 200L for Lead Dusts.

DOUBLE WILLSON PRODUCTS INCORPORATED
READING, PA., U.S.A. Established 1870

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RESPIRATORS
HELMETS

Get ALL 4 BENEFITS with

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1 SAVE ON CLEANING COSTS

The most economical way to get *all* the dirt. Vacuum cleaning collects 66% more dirt in same time.

2 REDUCE PLANT MAINTENANCE

Prevents discoloration and corrosion of painted surfaces and steel work. Brightens walls—postpones repainting.

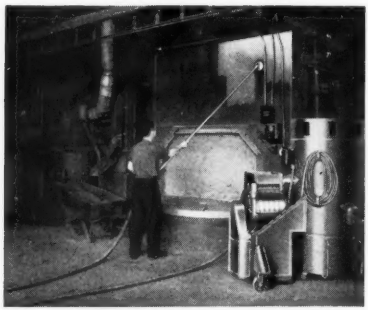
3 PREVENT DAMAGE TO PRODUCT

Dust particles filtering down from overhead frequently cause costly damage to products in process of manufacture.

4 PROTECT WORKERS' HEALTH

Protect health of workers. Breathing dust laden air is a serious health hazard. Hoffman equipment provides safe working conditions.

WRITE FOR NEW BOOKLET:
"REMOVE THE MENACE OF DUST"



U. S. HOFFMAN
MACHINERY CORPORATION
Air Appliance Division
100 East 12th St., New York, N.Y.

Why Should You Maintain A Clean Plant?

"I'll bite, why should we?" asks industrial management.

You don't have to search through statute books, state codes or insurance regulations to find the reason. Common sense and good business—that's the answer.

Here are seven reasons for keeping a plant clean:

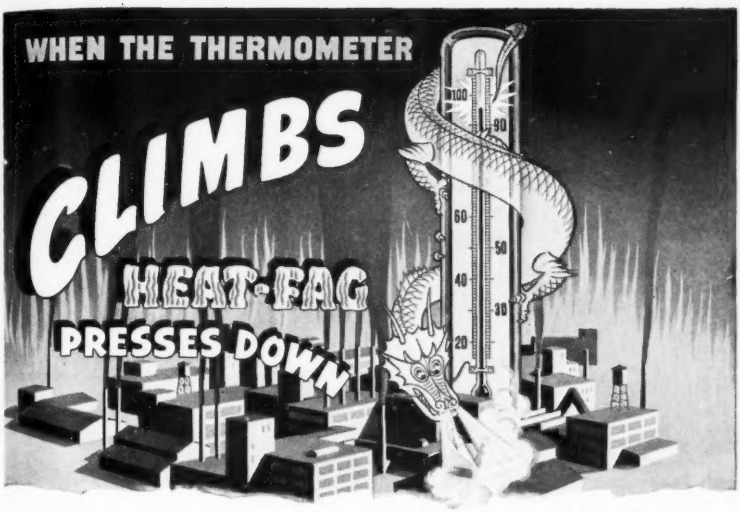
1. Protects the health and safety of workers.
2. Prevents damage to machinery and equipment.
3. Reduces maintenance costs.
4. Increases production efficiency and economy.
5. Improves employer-employee relations.
6. Builds community good will.
7. Lowers insurance costs.

These seven reasons add up to one word —PROFITABLE. A clean plant is a profitable plant. This is true not only from a dollars and cents standpoint, but also from the standpoint of intangible results which cannot be measured directly in terms of money, but which play such a vital part in determining the success or failure of industry today.

Providing workers with a clean, healthful, safe place in which to work is a legal and moral responsibility. Furthermore, it is economically sound. State sanitary and inspection codes place the responsibility for clean, sanitary working conditions on management. Present day industrial operations and relations encourage such conditions.

Regardless of other reasons, good business demands "good housekeeping" practices. While a primary reason for plant cleanliness should be humanitarian—the

[*Continued on page 6*]



HEAT-FAG is a reality — an unseen but actual force which costs industry thousands of dollars every time the thermometer climbs. Hot days and heavy work make men sweat — and unless the salt that's sweated out of their bodies is replaced, Heat-Fag takes its toll, production sags, and profits suffer.

Protect Workers Against HEAT-FAG

In hundreds of the nation's leading plants, Morton's Salt Tablets are at every drinking fountain. These handy tablets, taken with a drink of water, represent the most convenient and easiest way to keep the amount of salt in the body at just the proper balance intended by nature.

MORTON'S SALT TABLETS Dissolve in 50 Seconds

They are easy to take . . . they dissolve quickly. Only the purest and most highly refined salt is used!

MORTON'S DISPENSER—Sanitary, Economical, Convenient

This modern dispenser — and Morton's Salt Tablets — represent the most efficient and sanitary method yet perfected to supply salt to employes. A single push of the lever at the base dispenses one tablet at a time. Install Morton's Dispensers and Salt Tablets in your plant now. Place your order today. Shipments will be made promptly — prepaid.

Write for folder—"Heat-Fag"

MORTON SALT COMPANY CHICAGO, ILLINOIS

Useful Free Literature

The publications briefly described in this service department are prepared by manufacturers' technical experts. The data they contain on equipment, supplies and prevention methods applies to varied phases of occupational hazard problems.

114—LADDER SHOES

A Duo-Safety Ladder Corp. folder, illustrating and describing features in ladder shoes and ladder equipment.

115—LAMP GUARDS

Portable lamp guards and their use in protection of life and property are illustrated and described in a folder of the McGill Mfg. Co.

116—INDUSTRIAL CRANES

A new bulletin of the Harnischfeger Corp. includes material on the design and application of industrial cranes for general industrial usage. Gives structural and mechanical details.

117—SAFETY SIGNS

Stonehouse Signs, Inc. have issued a colorful folder showing all types of safety and warning signs. Includes descriptive data and sizes available.

118—INDUSTRIAL CLEANING

Commemorating three decades of service, Oakite Products has issued a special edition of Oakite News. This booklet outlines development of cleaning materials and methods, and includes discussion of trends of industrial cleaning research.

119—ABRASIVE MASK

A folder of the Mine Safety Appliances Co. describing the M.S.A. abrasive masks, and illustrating its construction and use.

120—FLOOR FINISHES

A 24-page booklet issued by the Portland Cement Association illustrates and describes floor finishes and gives specifications for resurfacing.

121—FLOOR MAINTENANCE

West Disinfecting Co. has issued a new folder on a wide line of floor cleaners and sealers, adaptable to wood, tile, cement, rubber and other types of flooring.

FREE LITERATURE COUPON

Clip out and paste on postcard or enclose in envelope.

Nos. of desired items .....

Firm Name .....

Your Name ..... Position .....

Street and Number of Your Firm .....

City ..... State .....

FL-6

122—RESPIRATOR

Construction details, typical uses and other information supplied—air respirators are included in a folder of the Acme Protection Equipment Co.

123—WIRE ROPE

Booklet of the Broderick & Bascom Rope Co. Contains information on the manufacture and use of wire rope. Includes description of many different types of logging systems.

124—EXPLOSION PROOF MOTORS

Allis-Chalmers has issued a new folder on explosion proof motors, including installation and construction views in dangerous locations.

125—SAFE FOOTING

An interesting descriptive folder on oil resistant soles and heels has been issued by the Lima Cord Sole & Heel Co.

126—INDUSTRIAL CLEANING

A new booklet of the Spencer Turbine Co. illustrates and describes a complete line of portable and central vacuum cleaning systems, and includes useful data on representative industrial installations.

Where Safety Men Meet

April 3-4, Boston, Mass.

Eighteenth Annual Massachusetts Safety Conference. General Manager, Lewis E. MacBrague, Massachusetts Safety Council, Inc., 80 Federal St., Boston, Mass.

April 18-20, 1939, Columbus, Ohio

Tenth All-Ohio Safety Congress. Thomas P. Kearns, Superintendent, Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus, Ohio.

April 27, Beloit, Wis.

12th Annual Rocky River Valley Safety Conference. Oscar Nelson, Exec. Sec., Beloit Commercial Club, Beloit, Wis.

May 9-11, 1939, Chicago, Ill.

Seventeenth Annual Midwest Safety Conference. George G. Traver, Manager, Greater Chicago Safety Council, 225 North Bank Drive, Chicago, Ill.

In the Finest Industrial Plants

Section of washroom of tool manufacturing plant equipped with Bradley 54-in. circular Washfountains.

Bradley Washfountains serve ten persons at one time, eliminate waiting and delays,—give each washer his own spray of clean, running water. . . . They promote cleanliness—reduce chance of skin affections. . . . They are self-flushing and permit no water to gather in the bowls. . . . Space is saved—water costs cut 70%.—They reduce the amount of piping connections—and are practically indestructible. You can install Bradleys in old or new buildings—pay for out of savings.

Bradley Washfountain Co.
2259 W. Michigan St.
MILWAUKEE, WIS.

BRADLEY WASHFOUNTAINS

Write for Bradley's free booklet "Washroom Layouts."

THE SAFETY VALVE

[*Continued from page 2*]

health and welfare of workers—the attitude of some industrial management is that expenditures for "good housekeeping," like any other operating expense, must be justifiable economically—must show a dollars and cents return on the investment. Strangely enough, management, which considers the welfare of workers in itself as sufficient reason for maintaining a clean plant, finds that plant cleanliness actually pays a dollars and cents dividend.

Dust and Dirt Destroy

Dust and dirt need not, and should not, be tolerated. They are harmful to workers and destructive to machinery and equipment. Progressive management does not expect employees to work in dusty, smelly atmospheres, in surroundings littered with refuse; to drink out of common dippers; to wash (if there are any facilities at all) in buckets or dirty bowls; or to spend their working day in a dark, dirty, unsanitary environment. Workers in clean, light, healthful surroundings perform their work more efficiently and have the greatest loyalty to their employer and company. Wise management realizes that dust particles may be corrosive and damaging to valuable machinery and equipment. With an eye on maintenance costs, upkeep, and repair bills they avoid needless expense by maintaining daily cleaning practices in the workroom and in the washroom.

Keep your plant clean, provide your workers with a clean, light, sanitary place in which to work and you build a sound foundation for the most favorable relations with your employees. And in so doing you automatically increase your operating profits.

Industry today is carrying its right for existence and for profitable operations directly to the public. It asks for community co-operation and support, pointing out the benefits it gives to the community in which it operates. Rightly so. But, as a part of this program, industry must, if it is to secure this community support, maintain clean, healthful plants. It must make the community proud of its presence. It must be a community attraction, not an eyesore.

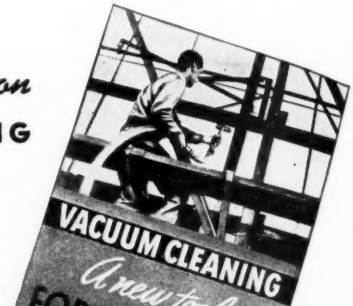
An attractive plant—clean inside and out—is a profitable plant in operation.

Write for this New Book on

INDUSTRIAL CLEANING

See how others clean large areas at low cost and save in production and maintenance because Spencer does the jobs that cannot be done by other methods.

The complete line of Spencer Portable and Central Systems from 1/3 H.P. up—and the Spencer Industrial Vacuum tools are described in this book. Yours on request.

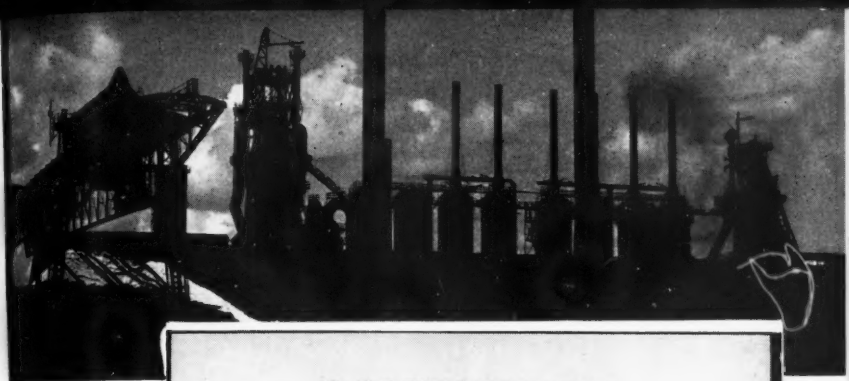


150-A

SPENCER HARTFORD

CENTRAL AND PORTABLE VACUUM CLEANING SYSTEMS

THE SPENCER TURBINE COMPANY, HARTFORD, CONN.



OCCUPATIONAL Hazards AND Safety

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Front cover: Good housekeeping and good maintenance are virtually synonymous among advanced industrialists. Photo courtesy Cleveland Graphite Bronze Co.

Vol. I, No. 7

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CH-5-C

There are thirteen other types

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Eyeshields

This eyeshield, of the cover-all type, is light, well ventilated, non-inflammable, non-fogging and adjustable to any angle. It has full metal binding, a visor guard that protects the opening between visor and forehead without checking ventilation and a head guard made of heavy, fire proof duck that gives ample protection. Adaptable for a wide range of industrial uses. Available in clear, smoked, amber and light green. Write for folder.

JACKSON ELECTRODE HOLDER CO.
15120 Mack Avenue Detroit, Michigan

Protectors in Standard Safety Code

A revised and up-to-date copy of the "American Standard Code for the Protection of Heads, Eyes, and Respiratory Organs" has just been issued through the National Bureau of Standards. This code classifies the various industrial operations and processes which present a hazard to the head, face, neck, eyes or respiratory organs of a worker. Each month "Occupational Hazards & Safety" will present one of these classifications with the Protectors recommended for protection to workers. This is the first in the series.

Group A

Processes where protection from relatively large flying objects is required. Examples: chipping, calking, some riveting operations, sledging in quarries, etc.

Protectors

Goggles—Two styles of goggles are permissible: those having rigid, non-adjustable bridge (or adjustable metallic bridge) with side shields; those having flexibly connected lens containers shaped to conform to the configuration of the face. Where side vision is important, goggles without side shields may be used.

Face Masks—Made of metal, vulcanized rubber, fiber, or equivalent material and shall have no openings in the front other than required for lenses and breathing attachments. Masks should be shaped to effectively protect the entire face.

Helmets—Rigid construction for shielding the eyes, face, neck and a portion of all other parts of the head, and held in place by suitable means.

BURNITOL Paper Cuspidors
for Economical Plant Sanitation

BE SAFE! BE CERTAIN!
BURN—IT—ALL!

PROTECT workers' health. Promote plant cleanliness and sanitation. Replace unhealthful metal containers and eliminate costly, messy cleaning jobs. It's Easy and Economical! Just place BURNITOL Paper Cuspidors around machinery and other places within easy reach of workmen.

BURNITOL Paper Cuspidors are water-proofed, wire stitched, substantial. Cost only a fraction of a cent, more than pay for themselves. Used by leading manufacturers everywhere. Size 6½" x 6½" x 3". Three grades.

No. 7 per 1M—$13.00 No. 8 per 1M—$8.10
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BURNITOL MANUFACTURING CO.
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DEPENDABLE PROTECTION FOR EVERY BREATHING HAZARD!

Bring your respiratory problems to Pulmosan . . . pioneers in respiratory equipment and makers of the most complete line of dependable respirators on the market.

Pulmosan can supply the exact model engineered for your specific needs and budget.

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More than 40 Types for Dusts, Fumes, Gas, Smoke, Sprays

Every Pulmosan Respirator is designed and constructed to provide highest safety, comfort, ease of breathing and long service for its particular type and purpose.

Pulmosan Respirators feature an all-aluminum body, patented rubber face cushion, positive exhalation valves and advanced construction in every detail. Make comparative on-the-job tests!

WRITE, telling your breathing hazard, for proper recommendation. Ask for literature.

INDUSTRIAL SAFETY EQUIPMENT ASSOCIATION

PULMOSAN SAFETY EQUIP. CORPORATION

Dept. OH, 176 Johnson St., Brooklyn, N. Y.

EVERYTHING FOR INDUSTRIAL SAFETY

Goggles	Safety Clothing	Gloves	Ladder Shoes	Carboy Truck
Helmets		Aprons		Carboy Tilter
Hoods	Chemical Handling	Ladders	Safety Tools	Safety Signs
Masks		First Aid		etc., etc.

• Write for details and prices. Present your problems.

Housekeeping Hints For The Industrial Bride

—And for "Golden Wedding" industrialists who have yet to realize the importance of good housekeeping methods.

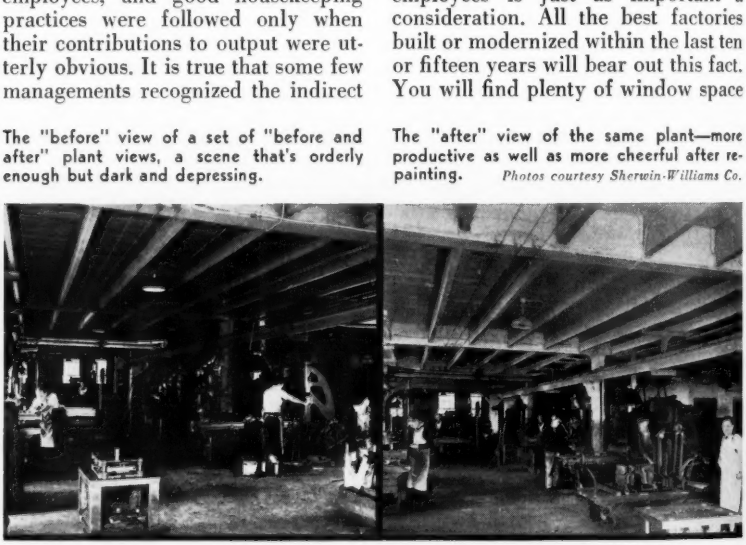
By Wilson Locke
Maintenance Mgr., Ball-Norton Co.

UNTIL recent years most industrial plants were laid out and constructed with only one purpose in mind—the most efficient and economical production. General plant layout and location of equipment conformed to that pattern which permitted the easiest and quickest handling of the product manufactured, from raw materials to finished goods. Little consideration was given to the well being, the health and safety of employees, and good housekeeping practices were followed only when their contributions to output were utterly obvious. It is true that some few managements recognized the indirect benefits of what has come to be termed "good house keeping" in industry, and took steps to protect the welfare and safety of workers along with adoption of housekeeping programs. But such was the exception rather than the rule.

Today, while efficiency and economy in production are still primary considerations in new industrial construction and modernization, it is generally accepted by management that the health and well being of employees is just as important a consideration. All the best factories built or modernized within the last ten or fifteen years will bear out this fact. You will find plenty of window space

The "before" view of a set of "before and after" plant views, a scene that's orderly enough but dark and depressing.

The "after" view of the same plant—more productive as well as more cheerful after repainting. *Photos courtesy Sherwin-Williams Co.*

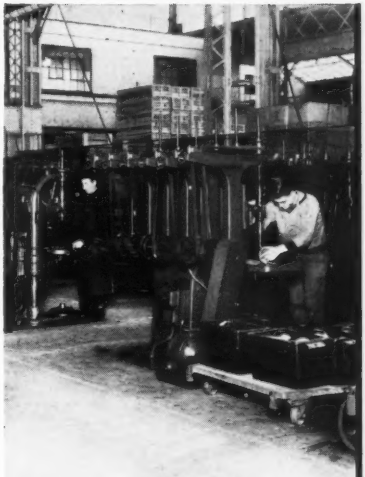


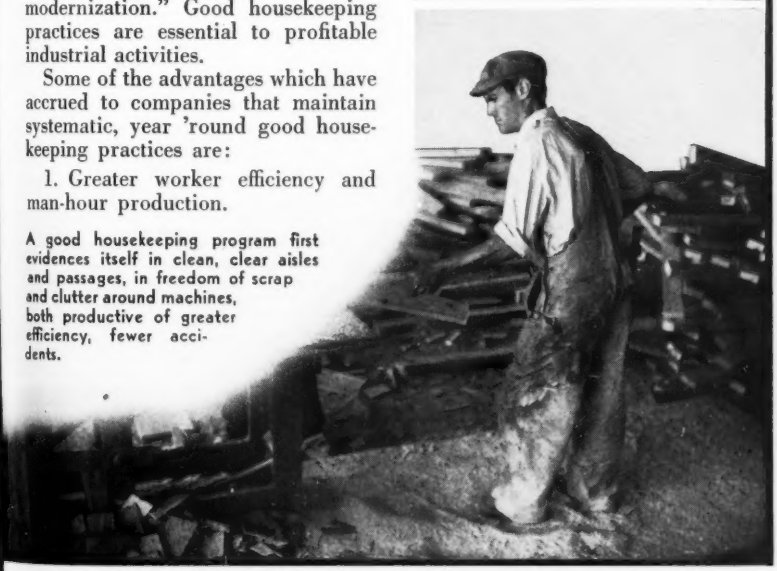
for ample light and fresh air; adequate artificial lighting; dust and fume removal systems; painted and clean interior surfaces; adequate storage space; safe floors; clear aisles between machinery and "a place for everything, and everything in its place."

Although humanitarian reasons, the broadening of workmens' compensation and occupational disease laws, the pressure of insurance companies, and the force of public opinion have played an important part in this development, there is a more tangible reason. Management has come to recognize the fact that the most efficient and economical production—the most profitable operations—can be realized only when employees work in clean, healthful and safe environments. "Plant safetization" is a definite part of "plant modernization." Good housekeeping practices are essential to profitable industrial activities.

Some of the advantages which have accrued to companies that maintain systematic, year 'round good housekeeping practices are:

1. Greater worker efficiency and man-hour production.





A good housekeeping program first evidences itself in clean, clear aisles and passages, in freedom of scrap and clutter around machines, both productive of greater efficiency, fewer accidents.

2. Fewer mistakes and faulty jobs.
3. Decreased operator fatigue.
4. Fewer accidents.
5. Improved worker morale.
6. Lower maintenance costs.

Let us consider briefly some of the pathways to good housekeeping which aid in achieving these benefits.

The Part of Paint

"A little paint goes a long way" as the saying goes, holds true in industrial cleanliness. The experience of the Cleveland Graphite Bronze Co. illustrates this point. A few years ago pictures were taken of the machinery and equipment for the purpose of visually describing the operations in the plant. The pictures turned out well. But what they showed was not so good. Dirty, greasy machinery, floors littered with waste, old rags and burlap being used to stop leaks in oil lines, and other similar costly practices showed up dramatically in the pictures. Being a company with top executives completely sold on plant health and safety, no time was lost in remedying these conditions. The machinery and equipment were painted in a cream color. With plenty of window area for natural light, and with the structural equipment already painted and clean, it was like a new plant. The results were better than expected. In addition to efficient operation and lower maintenance costs, workers began to take more interest and pride in their work and their personal appearance. They kept themselves, their machines and the floor clean and neat.

Only industrial slatterns tolerate such filth and untidiness.

Paint protects and preserves equipment and structural materials. And paint helps brighten up workrooms, thereby improving worker morale.

Lighting's Contribution

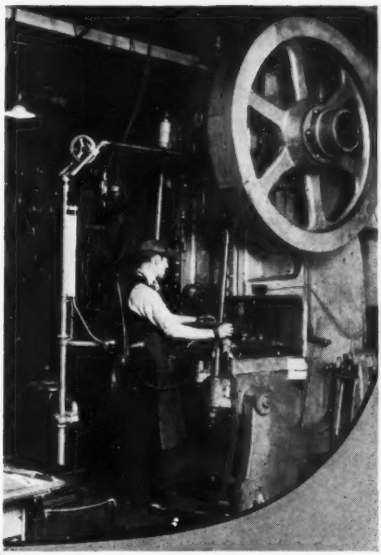
Going hand in hand with a bright, well painted interior is proper lighting. In a majority of industrial jobs workers must see well what they are doing to do well. Many operations today are exacting in nature. Improper lighting not only impairs the eyesight of the worker but lessens the chance of his turning out accurate and acceptable work. Proper lighting, with the right amount of foot-candle power is almost as dependent on good housekeeping as on good equipment. Dirty bulbs and reflectors destroy the effectiveness of the most modern installations.

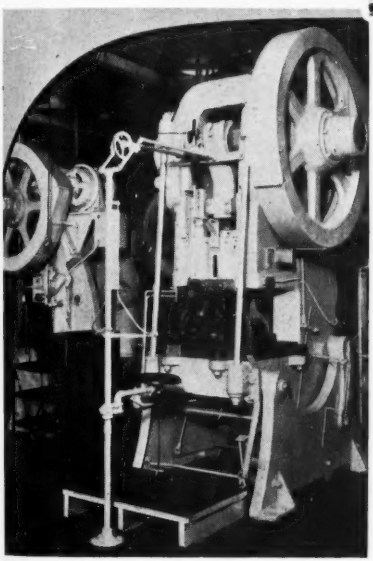
Underfoot

Maintaining floors in a safe and clean condition is one of the most important, yet most difficult, problems facing management with respect to "plant safetization." The floor receives more wear and tear than any other part of the plant. The most substantial flooring, subject to daily punishment from foot and equipment traffic, needs daily inspection and cleaning. Slippery floors are dangerous to the safety of workers, and take a high annual toll in lost time, serious injury and compensation payments from industry.

Daily cleaning with modern methods will help reduce to a minimum accidents from falls, and is a basic requirement for plant cleanliness. An important consideration in the purchase of industrial flooring should be its safety features and its adaptability to cleaning. Accumulations of oil and grease about machinery should not be tolerated. Neither should rubbish and waste heaps be allowed to pile up. Placing refuse cans and waste containers around encourages floor cleanliness.

Cracks and worn places in floors should be repaired as soon as they are discovered. Such places catch and hold dirt and dust, present hazards to safe foot traffic, and impede the easy movement of trucks about the plant. Floor repair materials are obtainable today and are easy to apply.



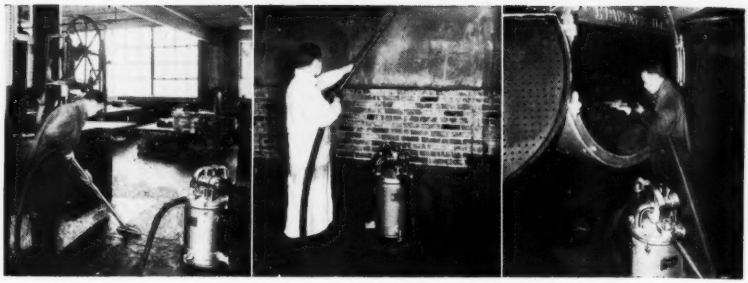


A stamping press before and after a trip to the "beauty parlor." Periodic repainting of machinery simplifies detection of oil leaks and flaws, in addition to aiding maintenance.

Insuring Clear Passage

Keeping aisles and passageways around machinery, storage bins, materials, and exits clean and free from tools and equipment has been achieved by many plants in a simple manner. Wide lines, in a color contrasting to the floor surface, are painted on the floor to mark aisles and to keep passages free. Aisles should be wide enough to give workers at bordering equipment plenty of space, and to permit the free and easy passage of trucks through the plant. Perhaps no one thing contributes more to giving a plant the appearance of being neat and clean than wide, clear and unobstructed aisles.

[*Continued on page 37*]



Photos courtesy Breuer Electric Co.

A Look at the Records

By Henderson Richards

Tests have proved that a "clean sweep" of a company's floors is as rare as one of its sales markets. Performance data shows vacuum cleaning an infinitely better method.

ESSENTIAL to plant cleanliness, and one of the basic "good housekeeping" practices, is the removal of dust and dirt from workrooms, washrooms and other locations. The final and proper solution of this problem includes more than merely "sweeping" the dust and dirt from the floor. Safe, healthful and profitable cleaning includes the removal of dust and dirt from walls, ceilings, beams and girders, from machinery, storage bins, tops of lockers in washrooms and other "out of the way" spots.

The much satirized practice of the housewife sweeping the dirt under the rug is no joke in many industrial establishments. It is a common practice to sweep the dust into a "corner." While wise management, seeking the most profitable operations, has established modern cleaning methods, many plants still adhere to the "broom and dust pan" method. The latter is not only ineffectual and incomplete, but is costly.

Dust and dirt particles, in the atmosphere and filtering down from overhead structures, are a health hazard for workmen. This is especially true if the dust has toxic qualities. Providing a dust-free atmosphere for your workers protects their health and increases their efficiency. Efficient removal of dust from equipment and machinery lengthens the life and use of such equipment. One sure way to reduce plant maintenance costs is cleanliness—keeping the plant free from destructive dust, fumes and dirt. Dust and fumes are discoloring to painted surfaces and may be corrosive to equipment and structural material. Keeping the atmosphere and plant structure free from dust brightens the shop environment, prevents costly destruction of equipment and

cuts down on upkeep—a most important item in the profit and loss columns of every company.

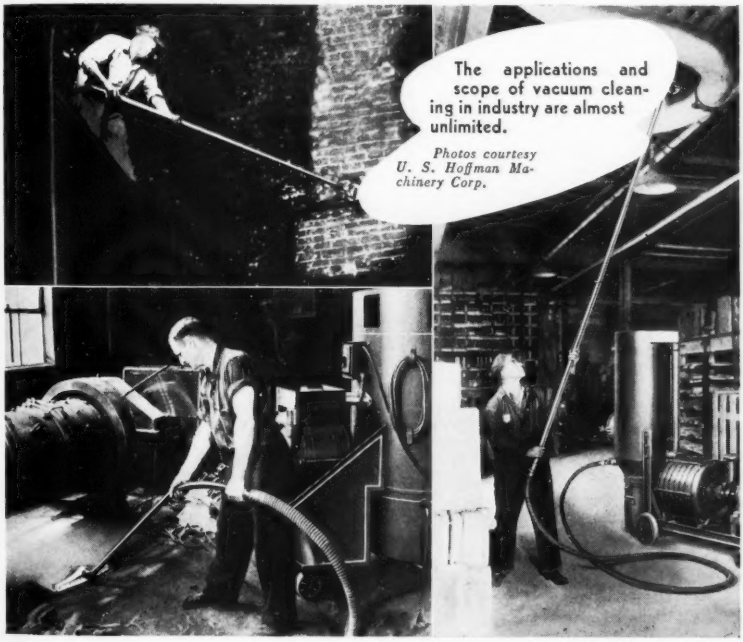
Why use modern vacuum cleaning methods? The following performance reports, taken from the actual records of plants, are typical of thousands of experience records, and answer this important question in a most convincing way.

"Our cleaning problem is complicated by a large quantity of dust produced in manufacture, some of which is abrasive. Dust and dirt are harmful to the product itself in the course of its manufacture so that efficient dust-removal is a distinct aid in producing a better product. Considerable dust accumulates overhead on pipes and beams and, unless regularly removed, is dislodged by vibration and distributed around the plant.

"Formerly brooms and brushes were used for cleaning. This method was never satisfactory, as it simply stirred up much dust instead of removing it completely. Much of such stirred-up dust settled on machines and on overhead pipes and beams, requiring later removal by costly hand-cleaning methods.

"The vacuum cleaner which we installed is used regularly for three major cleaning operations: floor cleaning, both in aisles and around machines where it operates without interruption to work in process; cleaning overhead pipes and beams where it eliminates the necessity for ladders and scaffolding with their attendant dangers to workmen; cleaning the outside of bags in which raw materials are stored and which are stacked at various locations in the plant.

"Four men are employed regularly in plant cleaning. Although the same number of men were employed before the machine was purchased, the company states that at



The applications and scope of vacuum cleaning in industry are almost unlimited.

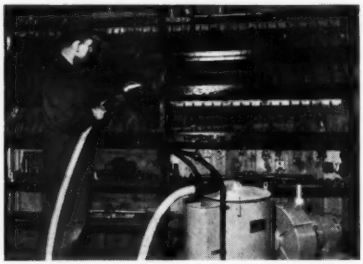
Photos courtesy U. S. Hoffman Machinery Corp.

THERE'S PROFIT IN PREVENTION

least 5% more cleaning is now being handled by this same force.

"This cleaner has proved a very sound investment, not only because of time and labor saving made possible, but more particularly because of the much better cleaning and greatly reduced amount of plant dust as compared to former brush and broom method."

FERRO ENAMEL CORPORATION
CLEVELAND, OHIO



A typical "special" plant service performed by vacuum cleaning equipment.
Photo courtesy Invincible Vacuum Cleaner Mfg. Co.

"Our cleaning problem is similar to that encountered in nearly all metal-fabricating plants; metal turnings, rust and scale mixed with graphite, emery and oil accumulating on the floor. This, in small particles, is readily stirred up and distributed through the air by ordinary broom and brush sweeping.

"The decision to purchase a vacuum cleaner came as the result of the company's interest in providing better and more healthful working conditions for its men. At first several of the executives were frankly skeptical, but were convinced after witnessing a demonstration that the machine offered definite possibilities for improving plant conditions. Now, following their own experience, all are enthusiastic about its performance. Today the plant is almost a model of cleanliness. The floor is really clean at all times where formerly dust would be evident only a short time after sweeping, either settling out of the air or being brought up from between the wood blocks by the passage of electric trucks and trailers. At least 60% of the germ-carrying dust has been eliminated from the air in the plant. Lighting is better since there is less dust settling on the windows and skylights and it is estimated that window cleaning bills will be cut in half. Because of the clean surroundings the men are better satisfied. According to the Production Manager, they now can turn out more work and better work."

THE PARKERSBURGH RIG & REEL CO.
PARKERSBURG, W.VA.

"In the paper industry, one of our greatest enemies is dirt. When dirt gets into the air as dust, it injures our workers' health, damages machinery and lowers the quality of our product. A paper mill must be kept clean, from the beaters clear through to the shipping room.

"Our vacuum cleaner is now used mostly at night, to clean wood, concrete and steel plate floors, walls and under and around machines where paper dust collects. We also use it to clean super-calender rolls while sanding them.

"When we clean our motors we put a hood over them and blow out the black, greasy dirt with compressed air, then gather up the dirt with the cleaner. In addition, we use it to clean hoods on paper dryers.

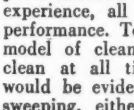
"In our finishing room, where paper is sorted and counted by girls, the greater cleanliness has caused a marked decrease in absence on account of illness. These girls work close to the floor and, if there were any dust around, they would be sure to breathe it. Therefore, we give the vacuum cleaner credit for their better health.

"In a year's time the cleaner saves us two men's time, or $2,000.00 in cleaning labor and $80.00 in brooms. The cleaner actually pays for itself more than four times a year, but, even if it didn't, we could not afford to do without it."

MIAMI PAPER COMPANY
WEST CARROLLTON, OHIO

"Our vacuum cleaning unit was bought about a year ago and we are able to get into rafters and corners where dust congregates and really remove it with very good success. Our foundry is one of the few believing in painting its interior and, although it is of a light color, we find that this machine keeps it looking bright and clean."

SMITH STEEL FOUNDRY CO.
MILWAUKEE, WISCONSIN



By J. L. HYLAND
Manager, Chicago District
Republic Steel Corporation

PROGRAM HOUSEKEEPING

FOR many years bulletins have appeared in industrial plants and, in some cases, permanent signs with the slogan: "A clean plant is a safe plant." This slogan is a true one, as you will not find safety in the midst of filth, disorder, or poorly managed industrial organizations.

Republic Steel Corporation in all of its plants has a regular procedure set up for clean-up inspections on schedule and a system of rating by which departments compete for the distinction of having the cleanest department in a particular plant.

Regular inspections are made of each department every month by the superintendent of a different department, who fills out a report which becomes a demerit for all unclean, untidy and disorderly conditions which he discovers. Copies of this demerit report are sent immediately to the head of the department inspected. Conditions reported are to be corrected within a period of five days after receipt of the demerit report. If, for some reason the condition has not been corrected by the time of the next regular inspection, a penalty of five demerits is imposed. A special printed form on a distinctively colored paper is used for reporting demerits.

The clean-up ratings are determined practically in the same manner

as accident frequency ratings. In arriving at an accident frequency rating, we figure the number of accidents per million man hours worked and the clean-up rating as figured on the number of demerits per number of men employed. If there were two accidents per million man hours worked, the rating would be 2.00. If there were two demerits for one hundred employees, the rating would be 2.00, which subtracted from 100% rates the department 98% clean.

At the beginning of 1938, the Chicago District inaugurated a system of awards for the purpose of stimulating interest, developing the competitive spirit, and inspiring greater pride in the cleanliness of the departments. Each month since that time the department rated as the cleanest department in the district becomes the possessor for the following month of a distinctive trophy with the name of the winner suitably inscribed on it. At the end of the year the department having the best over-all annual rating becomes the permanent holder of this trophy.

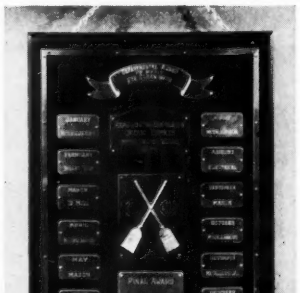
In addition to the departmental trophy, two large stainless steel roasters go to the winning department each month and a drawing is held in that department in which all of the employees participate. The two winners receive their roasters and have their pictures taken, and that picture is prominently posted in the plant on the plant bulletin boards.

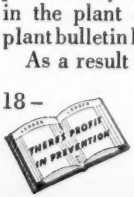
As a result of this competition, the plants in the Chicago District, which always have had a reputation for cleanliness and orderliness, are now easily maintaining that reputation. Some of the superintendents, who were not as frequent monthly winners as they could have been, have recently appointed their own sub-department clean-up committees.

Another advantage lies in the fact that it is easier to keep a plant clean through this system of regular inspections than it is by making a general periodical clean up.

Some ceremony is attached to the awarding of the clean-up trophy and the drawings for the stainless steel ware, as the superintendent of the department losing the award must make the presentation to the superintendent of the department winning the trophy for that month, in a group meeting of the employees, and at this time the drawing for the roasters is held.

Republic Steel Corporation really believes that cleanliness promotes safety. Experience has borne out this belief. Each and every employee cooperates with his superintendent whole heartedly in keeping his department clean. With plant cleanliness and safety so closely related, the desire to promote one naturally stimulates the desire for the other. With the achievement of a clean plant comes the achievement of a safe plant. A set program and definite employee incentives are essentials to these joint goals.





A Case History of Dust

Whenever at all possible, dust is best coped with at its source. Suppression is not the impractical, prohibitive matter it often appears, as witness this account.

By J. B. LAMENZO
Research Engineer, Hartford
Accident & Indemnity Company

"JIM," said the General Manager to his Superintendent, "I want you to see what can be done about the dust from the large casting shakeout."

"I've already thought about it, Chief, and I don't think there is a thing we can do." Jim was earnest and sincere.

"But something has to be done about it. I never considered the seriousness of the situation until last night when I had the opportunity of listening to an engineer whose firm specializes in dust suppression.

"I learned that, not only does this dust impair the health and efficiency of our workers, but it also raises havoc with our machines. Maybe that's the reason for our large machine shop maintenance expense and although we can't move the machine shop, we certainly ought to be able to trap that dust."

"But," interrupted Jim, "to do that you'd have to build a special shop and then use water."

"Water?—Not that—that's not what the Engineer said. Let's go over my notes and pick out the most important points."

In going over the notes with his Chief, Jim learned, among other things, that: (1) The immediate profit from adequate dust control is based upon the suppression of its dangers to men and machines. Dust in industry adversely affects the efficiency of labor and machines. The suppression of dust, therefore, is a matter of health to men and profit to business. (2) Effective control is best accomplished by suppressing the dust at its source. This, in general, means that dust should not be permitted to spread. On machines that originate dust, there should be a hood or enclosure that will suppress its spread by directing it into channels for collection. The suction method is, of course, the logical one for carrying the dust away. (3) The air containing dust must then pass through a filtration process before the dust can be entirely controlled. A filter of fine mesh cloth of a screen or bag type, as well as various wet types, and the electrical precipitation method are available for the collection of dust. (4) A dust control system consisting of hoods or enclosures, suction connections at such dust sources, a piping system, and a filter will, *if properly designed* (and Jim's Chief had underlined "if properly designed"), control dust, not only in the plant,

The photos above and below, at right, show the shake-out with and without the dust control in operation. The control mechanism is shown in the schematic diagram.

but it will also effectively collect this dust, including the fine invisible and injurious particles. (5) Dust control through positive filters greatly reduces housecleaning costs.

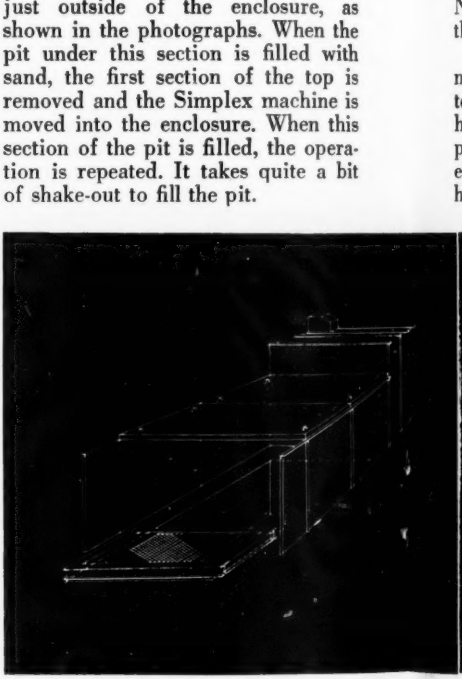
Closing his note book, the General Manager said "That's all there is. Now my suggestion to you is that you visit the engineer. Here is his card. Go over our problem and when you have something concrete, see me."

It was a tough job for Jim. He wasn't sold on the idea, but he carried on and with the aid of a capable dust suppression engineer, the system pictured here was installed.

The success of the system depended upon the ability of the unit to handle plenty of air quickly.

The enclosure has a top of two sections, each removable in turn. The enclosure is approximately twenty feet wide, ten feet high, and thirty feet deep. The rear portion of the enclosure is three feet higher, as the pictures and sketch indicate.

Underneath the enclosure there is a large pit eight feet deep, built in three sections. At the start of the shake-out operations, the pit is clean. The Simplex machine is in position just outside of the enclosure, as shown in the photographs. When the pit under this section is filled with sand, the first section of the top is removed and the Simplex machine is moved into the enclosure. When this section of the pit is filled, the operation is repeated. It takes quite a bit of shake-out to fill the pit.



This installation has been operating now for many months and it continues to work satisfactorily. The system is doing everything that the engineer, the general manager and his superintendent expected of it and, most important of all, the management considers the expense, which was no small item, highly justifiable.

Of interest is the fact that there is no deposition in the exhaust lines. The high velocity of the air current takes care of this. As far as housekeeping and maintenance are concerned, let Jim tell it to you.

"Excellent. In the days prior to this installation, we always had to do a lot of cleaning up in the morning. Now, we don't have to do this and the men are tickled to death."

Right here, I believe it is well to mention something about the forgotten man and what this system did for him. The crane operator is more pleased with the system than anyone else. Before the system was installed he was continually subjected to high dust concentrations and, in his cab, he had no chance of escape.

The main points in an installation of this type are: First, ample exhaust fan capacity; secondly, the movement of large volumes of air at high velocity through the exhaust main; thirdly, a pit large enough and of sufficient depth; and, lastly, an effective collecting medium.

An installation of this character requires much power. A large fan driven by a seventy-five horse power motor and with a capacity for *at least* 25,000 cubic feet per minute is necessary. *Capacity in the exhaust fan cannot be stressed too strongly.*

The principle demonstrated by this method of dust control is not only applicable in the case of large castings, as shown, but also to small castings, and those who have had experience with foundries know that the dumping or shake-out operation is the greatest source of dust dispersion and presents the greatest dust problem.

Better Lighting for Less Money

The sequel of an industrial illumination article by Mr. Warren, published in December. Efficient and economical illumination demands that good housekeeping attend provision of modern and adequate lighting equipment.

By Dean M. Warren
Secretary, Committee on Light & Safety
Illuminating Engineering Society

SAFETY in industry is too complex to be dealt with by an easy system of approach. It happens, however, that in most industrial jobs the employees must be able to *see* what they are doing *well*, if they are to know what they are doing. This dictum is true even though we grant that much work is routine motion. No matter how much we concede to the almost automatic hand or body movements in a worker's routine, his total effectiveness and hence his ability to take care of himself involves a seeing factor. Responses to danger warning must be on a split-second basis and the quicker a workman sees, the quicker he can respond. Good lighting makes seeing easier and hence is a definite aid in promoting safety.

Supplementary Lighting

Good general lighting must be supplemented in many industrial operations by higher levels of illumination. Supplementary lighting equipment, located where it will direct the required additional footcandles over the area where the seeing task is most severe, answers this need.

There are two types of supplementary lighting equipment, (1) small, relatively concentrating units which are intended to augment the general lighting over restricted areas, and (2) large area, relatively low brightness sources which may also serve as the general lighting system.

There are many types of concentrating units available today, which, along with the new projector lamp, are suitable for supplementary lighting. In using them, it is generally desirable that they be properly louvered to eliminate the possibility of direct glare. The large area diffusing units are of fairly recent origin and were developed to meet the need for a light source of fairly low brightness which

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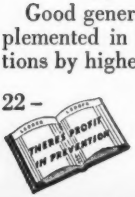


MATTERS OF SANITATION

Suitable equipment, regular maintenance and good house-keeping practices will prevent sanitation "leaks," often as expensive as accounting department "leaks."

By Dr. J. H. Chivers
Crane Co., Chicago, Ill.

LIBERAL construction given to workmen's compensation laws by the courts, the tendency toward "blanket" occupational disease legislation, the activity of industrial hygiene bureaus in twenty-one state departments of health, the state departments of labor and municipal departments of health are all evidences of the great interest being manifested in the health and well-being of the workman. Statistical studies have shown that each year a workman loses on an average of ten days from work because of illness and accidents incurred outside of employment. Illness contributes the major portion. How much of this illness is preventable? How much of it can be attributable to unsanitary environment and a lack of personal hygiene? A factual answer is difficult to obtain, but there is most certainly a unanimity of opinion among medically minded persons that infection, contagion, and the spread of disease in the human race is retarded and in many instances definitely checked by the application of the principles of good sanitation.

The term "sanitation" as now applied to places of employment pertains to the condition of the water supply, waste and sewage disposal, washing facilities, personal service rooms, and the maintenance of cleanliness throughout the plant. In the field of industrial sanitation the codes of various states prescribe in a general way the minimum sanitary requirements for the purpose of maintaining a safe place of employment. The statutes are frequently phrased in such ambiguous terms as "adequate," "sufficient," "suitable," "convenient," and thus afford neither the employer nor the enforcing agency of the state with a definite specification that can be provided and enforced.

Many employers have come to look upon design, construction, distribution, and maintenance of sanitary equipment in the factory as a positive reflection of the attitude of management in employer-employee relations. "A shop with good sanitation is a good place to work." Modern practice in the installation of all sanitary equipment calls for ample facilities located throughout the plant. The location, distribution, and type of fixtures should be considered in relation to the maximum number of employees working at one time and the nature of the work. It is poor economy to adhere to the minimum requirements so frequently set up in the state codes. Proper consideration

should be given to the human element which is so often expressed in the mental attitude of the employee toward his job. Obviously, washing, toilet and locker facilities should be close together, convenient, and readily accessible to employees using them. The arrangement, of closets and urinals, particularly, should be such as to insure a reasonable amount of privacy. Careful consideration of ventilation, heat, and light are fundamental concerns applicable to every toilet room, whether provided for employees, the public, or in the home. It is impossible to maintain cleanliness and a hygienic condition in a toilet room that is dark, cold, and poorly ventilated. Wherever direct outside ventilation can not be obtained the problem of artificial ventilation demands critical consideration. A situation which disturbs normal physiological function of the body is potentially building up ill health as well as ill feeling. A report of a survey of the United States Department of Labor (Bulletin 99—1933) covering the installation and maintenance of toilet facilities in places of employment indicates the lack of concern that has been given to this problem.

From a medical point of view there is a greater potential hazard to the health of employees arising from a faulty installation of sanitary fixtures than from any other single source of contact. This statement has particular reference to the danger arising from a cross connection between the waste supply and the water supply, whereby the drinking water accepted as pure becomes contaminated through a leak in an overloaded sewage pipe. This pollution of drinking water may also occur through back-siphonage or a fault in installation. Typhoid fever, amœbic dysentery, and other water-borne diseases, as well as poisoning by waste products from industry may arise because of negligence in inspection. Consideration should constantly be given in any plumbing installation to the danger of back-siphonage which occurs when a vacuum arises in a water supply line and the outlet is submerged with a faucet of a lavatory or sink extending below or even close to the water line when the bowl is filled. If this faucet is left open and a vacuum occurs back of the outlet, contaminated water is apt to be drawn into the supply line which will then mix with the fresh water supply and thereby pollute the drinking water throughout the entire building and even throughout the neighborhood. All faucets should be above the rim of the basin and at no time should a rubber hose or pipe attached to a clean water supply be permitted to submerge in dirty or waste water. Another potential danger exists where flush valves on a water closet are not provided with a "vacuum breaker"; particularly so where there is not an ample water seal in every closet bowl.

Installation is one thing, maintenance is another. Periodic inspection of the plumbing should be made to guard against the creation of a hazardous condition in a plumbing system that was originally safe. Changes in the plumbing system of any plant or office building should never be made except at the direction of a designated person competent to protect a clean water supply against the dangers of cross connection and back-siphonage. The responsibility of the cleaning of toilet rooms and the maintenance of a sanitary condition of the premises should be done by

[*Continued on page 37*]

This month in *Washington*

By W. T. Cameron
Chief Safety Adviser, Division of Labor Standards, U. S. Department of Labor

HOLLYWOOD, although preeminent in the production of motion pictures, can no longer claim a complete monopoly for, strangly enough, Washington is gradually becoming a secondary film center, albeit in a specialized field.

For a number of years the United States Government has been in the movie business, producing and distributing pictures on numerous technical, scientific and educational subjects. During this time certain Federal Departments have built up extensive libraries of these special films.

In recent years much has been said and written concerning the "documentary" film—a type which takes as its subject matter some phase of our daily life and problems and dramatizes this material in terms of social obligations. Thus, in addition to informing, the documentary film dramatizes and persuades. It is in this field that the Government has accomplished and is carrying forward outstanding work.

Uncle Sam is one of the world's largest producers of movie "shorts." According to a recent survey, nearly 400 Federal films are available for use before general or specialized types of audiences. This number represents releases from 26 different agencies. The Government began making films when the movie industry was very young—in 1911 the first Federal motion pictures were taken at the Shoshone and Roosevelt Dams and on the Pima Indian Reservation. In 1912 the Thomas A. Edison Company made a one-reeler entitled "Won Through Merit" for the Civil Service Commission. Since these early beginnings Federal film production has grown rapidly, both in quantity and variety of subject matter. It is now possible to obtain a Government movie on any one of a number of widely varied subjects.

What has all this to do with safety and health? Just this. Already there are available a group of Government films dealing with safety and health

promotion and there is reason to believe that this list will be increased.

AMONG the outstanding governmental films on safety and health, the following might be mentioned:

DEPARTMENT OF AGRICULTURE: "Dangerous Dusts," showing the causes and effects of dust explosions and their resulting fires. Preventive measures are outlined.

"Life Saving," which explains various methods used in rescuing drowning persons and resuscitation by the Schaefer prone pressure method.

CIVILIAN CONSERVATION CORPS: In addition to a number of films depicting the work of the Corps, two films are available showing safe work methods. They are entitled "Safety on the Job" and "Safety in Woods Work."

DEPARTMENT OF LABOR: The Division of Labor Standards of this Department has released a one-reel sound film, "Stop Silicosis," which shows the effects of constant inhalation of silica dust and outlines preventive measures.

BUREAU OF MINES: In addition to an extensive series of films dealing with the mining, fabrication and use of metals and other minerals, the following safety and health films have been made:

"Carbon-Monoxide — the Unseen Danger."
"Follow the White Traffic Marker."
"The Making of a Safe Miner."
"Oxygen Breathing Apparatus."
"Safety Glass."
"Twelve Points of Safety."

Two additional films are available showing the detailed duties of workers in coal mines as well as certain safe practices in these operations. These films are "The Shot Firer" and "The Coal Loader."

PUBLIC HEALTH SERVICE: This Bureau has issued two films dealing with health which should prove of interest to industry. They are "Three Counties Against Syphilis," and a film dealing with the importance of prompt treatment of pneumonia, the latter made in co-operation with the Metropolitan Life Insurance Company.

In most cases these films are available to responsible persons free of charge except for transportation from and to Washington, or other distributing point. Inquiries may be addressed to the agency in question or the U. S. Film Service, Washington, D.C.

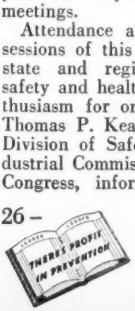
Ohio Anniversary Safety Congress Meets April 20

The All Ohio Safety Congress and Exhibit, to be held in Columbus, Ohio, April 18, 19, and 20, will mark the close of ten years of safety efforts concentrated in these meetings.

Attendance at and participation in the sessions of this Congress, as well as other state and regional meetings, stimulates safety and health practices and renews enthusiasm for organized safety efforts. Mr. Thomas P. Kearns, Superintendent of the Division of Safety and Hygiene, Ohio Industrial Commission, and Chairman of the Congress, informs Occupational Hazards and Safety that a splendid group of speakers has been lined up for the general and section meetings, and that the program will be timely and informative.

More than fifty exhibitors have reserved over seventy booths for displaying safety and health products, covering all fields of industrial protection and prevention equipment. These exhibition booths will be located in the main lobby of the Neil House, where the Congress will meet, and on the second floor.

Inasmuch as this convention is concerned with general safety matters, and is suitably timed for the purpose, the Cleveland Safety Council intends to have it serve as its May meeting.



The Engineering, Chemical and Hygienic Aspects of Dermatoses

First in a series of articles on the prevention of dermatitis.

In this series the following general order will be followed:

I. Engineering Aspects of Prevention.
   A. Mechanical Protection.
   B. Substitution of Substances.

II. Personal Protection.
   A. Materials.
   B. Some Protective Devices.

III. Personal Protection.
   IIB—continued.
   C. Protective Creams.

IV. Personal Cleanliness.

By G. C. Harrold, Ph.D.
Chief Chemist, Industrial Hygiene Division
Chrysler Corporation

MOST authorities on the subject of the prevention of dermatoses agree that cleanliness is the major factor. In the broad sense, cleanliness means not only washing by the individual but the removal of impurities from the environment and from the objects in close contact with him.

Mechanical Protection

The elimination of irritant materials from contact with the operator is the ideal state. However, this is expensive, difficult, and often impossible. Processes in some industries can be totally enclosed so that the employee does not come in contact with the materials in use. Many operations in general manufacturing lend themselves to the installation of partial enclosures so that exposures are reduced to a minimum.

The best examples of complete protection are found in the chemical industries where irritant chemicals may go through a whole series of operations without any exposure to the employee. Where irritant substances are in extensive use, the methods employed can be adapted to part or all of a process. Some of the generally used means are suction hose for handling liquids and solids, both in the introduction of raw materials and the delivery of finished products; automatic packing and packaging machines totally enclosed and exhausted; sealed rooms for automatically controlled grinding operations. Polishing operations, which liberate metal dusts, should be conducted in a closed room with suitable exhaust ventilation.

Thus in powder metallurgy, where very finely divided metals are used, all of the above preventive means are employed. Metals which may cause "metal itch," such as copper or nickel, provide concrete examples of what may be accomplished. The first op-

eration in handling the metal powder is the "mixing in" of various constituents. This operation is handled in partially exhausted, enclosed machines.

In addition to the local exhaust, general ventilation is provided for the room where the mixing operations take place. This mixing room is above other manufacturing departments so that totally enclosed gravity feeds of the metal dust mix are possible. The room is sealed from all other areas, and is provided with a vacuum cleaning system. The machines for pressing the powder into metal are enclosed and exhausted. In this manner, the amount of dust is reduced to a minimum and the exposure to that small amount of dust limited to a very few persons.

More examples can be found in those operations in which some one part of a manufacturing process requires protection. Thus, paint spraying of many objects can now be performed automatically. The object goes into an oven and is dried, and the employee handles only the dry painted object. The only exposure under such conditions comes when cleaning operations on the spray booth enclosures, pits, etc., take place. These are short-time intermittent operations and, hence, less hazardous. Personal protection, to be discussed later, must be provided in such cases.

Parts plating operations can be conducted in automatic machines, completely exhausted, where very little handling of material takes place by the workman.

Degreasing operations, using either alkali washes or the organic solvents of the chlorinated hydrocarbon type, can be conducted in completely automatic machines. The only exposure here is when tanks are to be cleaned. Smaller degreasers are kept from irritating the skin by using hoists with automatic speed control to remove work from the tanks and ventilating the benches or storage places for parts delivered from the operation.

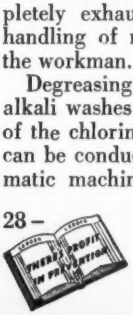
Where gaseous products are evolved, exhaust hoods can be provided for the operation. In the case of ovens, general overhead ventilation plus exhaust hoods at the entrance and exit to the ovens can be provided. Another way of treating this problem is to isolate the entrance and exit of the ovens from surrounding areas by means of strong currents of air. The use of strong air curtains a few feet from the oven entrance permits handling of large objects with no interference.

The above-mentioned and other preventive measures sometimes fail to a certain extent, particularly with regard to dusts. Vacuum sweeping devices should then be provided to keep floors, walls, ledges and benches free from irritant materials.

Substitution of Substances

A much to be desired but extremely difficult procedure is to provide substitute materials of a non-irritating character. Often cleaning mixtures of hydrocarbons and chlorinated solvents applied by hand rubbing can be replaced by less irritant and less toxic alcohol mixtures. Substitution can sometimes be aided by the use of some of the new wetting agents and detergents with water.

Numerous machining operations use "cutting oils" or "cutting compounds." In some cases, the complete removal of disinfectants from such solutions will aid in a dermatitis pre-



vention program. The disinfectants themselves may provide a source of irritation. This is particularly true if high concentrations are used wilfully or accidentally. Furthermore, the removal of agents which "cover up" the odors of too long used cutting compounds will lead to the more frequent replacement and cleaning of such mixtures. This is not necessarily more expensive, as the cost of disinfectant is eliminated. More attention is then paid to the important factor of removing metallic particles which break the skin surface and provide an entry for bacteria always present on the skin. This removal is best done by centrifuging and filtering. The heating of any cutting mixture containing oils should be discouraged as there is a good possibility that increased amounts of organic acids will result. These organic acids will then become potent irritations.

Many users still find disinfectants of value when used properly in conjunction with "cutting compounds." Properly used, with due regard for the above mentioned factors, these disinfectants may assist in the prevention of dermatoses.

The adding of kerosene to such mixtures to reduce foaming can be eliminated through the use of harmless anti-foaming compounds.

Some of the above aids to dermatoses prevention can be used in all industry. However, lack of volume of production or other reasons may make it particularly hard for small industry to install items of mechanical protection mentioned previously. In such cases, protective material or devices for the individual may be provided. While the cost is perhaps greater over a long period of time, the capital expenditure is less.

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Gauze that sticks only to itself

It is Gauztex. As white as the gauze itself. Guaranteed to remain cohesive. On the market three years. Used by General Motors, Swift, and thousands of plants large and small. Use instead of gauze or adhesive tape. Send for free sample, literature and price. General Bandages, Inc., 508 S. Dearborn Street, Chicago, Illinois.

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With the Barest Warning

Heat cramps give but slightly more warning than the average accident, but prevention is fortunately much easier.

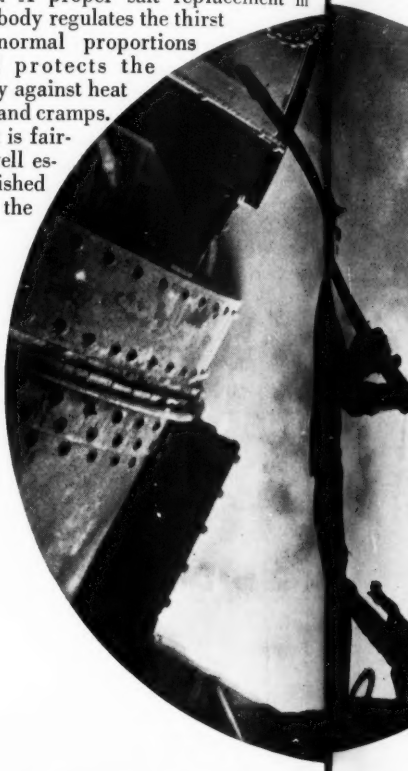
By E. J. McFadden

MEDICAL science in the laboratory has done splendid work in seeking the cause of heat sickness and in finding preventive and remedial measures for this well known, but dangerous, occupational hazard. And industry has been alert to utilize this knowledge in the prevention of heat sickness.

Heat fag is caused chiefly by excessive loss of salt from the body—the salt supply being depleted through heavy sweating. Through observation and experiments it has been determined just how much salt is lost through perspiration by men working under hot conditions. Applying the results of such tests to the amount of salt the body contains normally and which it requires, and to the amount of salt which the average worker consumes in food, it was found that workers in hot operations and during hot weather did not get enough salt to maintain the body supply at a normal and healthful level. The result was heat sickness in either a mild or severe form. The solution was natural and simple—getting the workers to consume more salt, enough to maintain the body supply at its normal level.

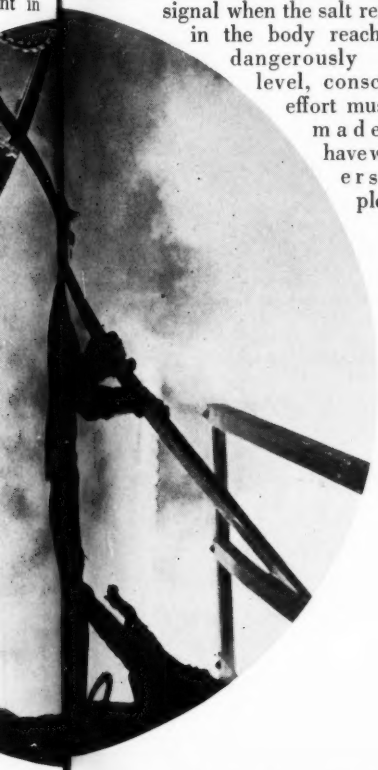
The natural desire of workers, who perspire excessively under hot conditions, is to drink a great deal of water. But water alone is not enough to offset the salt loss through perspiration. In fact, it is recognized that the practice of drinking large amounts of water, without the addition of salt, serves to dilute further the salt supply of the body, thereby making the body more susceptible to heat sickness. A proper salt replacement in the body regulates the thirst to normal proportions and protects the body against heat fag and cramps.

It is fairly well established that the



men working at hot and heavy operations, such as at the rolls and furnaces in steel mills, drink from one to two gallons of water in an eight hour shift. The proper amount of salt in ratio to the water consumed is a level teaspoon (approximately 83 grains) per gallon of water. Where salt is furnished to workers in the form of tablets (either sodium chloride or a combination of sodium chloride and dextrose) the ratio should be eight ten-grain tablets per gallon of water.

Because "nature" has failed to provide man with an adequate warning signal when the salt reserve in the body reaches a dangerously low level, conscious effort must be made to have workers replenish the body salt supply. The absence of a craving for salt, compared to the craving for water, when the sweat loss is large forces employers to provide a readily available salt supply for employees and to encourage the use of salt with drinking water.



Many plants are doing just that today and with beneficial results. The following few abstracts taken from many similar letters sent in to Occupational Hazards and Safety show concretely the value of this practice and prove conclusively that salt defeats heat fag.

"Our company has been dispensing salt tablets to our employees for several years with most gratifying results. We feel that the use of these tablets has almost eliminated sickness and lassitude due to heat.

"During 1937 and 1938 we did not have a lost time accident due to heat and the few cases of cramps that we had were not availing themselves of this service.

"Of course, we have no means of gauging the efficiency and the improved production from the use of these tablets, but it seems a logical conclusion that a man can do better work when he is feeling well and the "use of salt tablets certainly contributes to this when the weather is hot or the man is working in a hot environment.

"We feel that the salt tablets have a definite place both in and out of industry during the hot season of the year."

C. F. Engel, M.D.
Assistant Medical Director
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

"In 1934 we began using salt tablets. Since that time heat sickness

[*Continued on page 38*]

Right off the Docket

The trend of litigation on workmen's health and accident compensation is reflected in these briefs of the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist.

Cerebral Hemorrhage Brought on by Mental Strain Held Compensable

The claimant's husband was a timekeeper. His work necessitated the sending of his pay roll figures to Washington within five days after the end of each month. A mistake in the pay roll figures was discovered, and he worked some 23 consecutive hours to detect the error. While working he collapsed suddenly, and died.

The expert testimony was to the effect that the long hours of mental strain accelerated a condition of the heart or the circulatory system causing a cerebral hemorrhage resulting in death. The court recognized that the case was novel because the over-exertion was more mental than muscular. However, it held that the over-exertion which may make an injury or death resulting therefrom compensable need not be solely physical in character, since there is no fundamental difference in law or principle between an injury or death caused by the cutting or crushing of a blood vessel in the brain through the application of external violence and the breaking of one through increased internal pressure due to unusual or abnormal mental effort.

Monahan vs. Seeds & Durham et al. (Pennsylvania) 3 Atlantic 2nd 998 (Jan., 1939)

Employee Submission to Operation for Relief of Disability

The employee injured the index finger of his right hand. He claimed that his finger was stiff, and that he suffered pain in his arm and shoulder, that he couldn't work and was totally and permanently disabled. The medical testimony showed that if part of the employee's finger was amputated his disability would disappear, and he could perform his usual work. The employee refused to submit to the operation, and the trial court ordered him to do so, his compensation to cease otherwise.

On appeal, the order that the employee submit to the operation was held to be proper. The court stated: An employee seeking compensation cannot be required to submit to an operation to relieve disability where medical testimony shows that operation will be very painful and may seriously endanger life or where removal of disability by operation is doubtful. However, where it is shown that the operation is a minor one, unattended by danger, with little pain, and with almost certain success and relief from disability, it would be inequitable for employee to continue to draw compensation in the face of non-cooperation.

Leday vs. Lake Charles Pipe & Supply Co. (Louisiana) 185 So. 655 (January, 1939)

Silicosis Compensated in Action Based on Negligence

SILICOSIS in this case was contracted prior to June, 1935, at which time the Pennsylvania Workmen's Compensation Act made no provision for his "occupational disease." This action was brought on the theory that the defendant was

Digested and compiled by
HILTON E. ROBERTS
Member Ohio and New York Bars

negligent in failing to provide the plaintiff's husband with a safe place to work.

It was contended that the machines in the defendant's pottery plant were inadequate to remove the dust caused by a polishing process, and also that there was a failure to furnish dust masks to the employees. The defendant answered that the machines were adequate, and that masks were provided, but that the plaintiff's husband neglected to use his. The jury entered a verdict for the plaintiff.

On this appeal the court stated that if the employer fails to comply with the statutory duty to carry off the dust created by machines causing dust, and the employee without negligence on his part is injured by reason of such failure and neglect to comply, the employer is liable. It said further, that the questions of the employer's compliance with the statute, and of the employee's freedom from contributory negligence, were questions of fact for the jury, and had been decided in the plaintiff's favor. The verdict was affirmed.

Price vs. New Castle Refractories Co. (Pennsylvania) 3 Atlantic 2nd 418 (January, 1939)

Failure to Obey Warning Does Not Prevent Award

The injured worker was a resident manager for the defendant, The Fruit Dispatch Company. He had been in their employ for thirty years. In the line of his work he was called to inspect certain bananas, shipped to a wholesaler. The bananas were stored in a room filled with gas to speed the ripening of the fruit. The employee with his 30 years' experience, knew that explosive gas is used in the ripening process. In addition, just before he entered the storage room, he was warned not to smoke because of the gas. Nevertheless, while in the room he attempted to light his pipe. The resulting explosion killed him.

The employer contended no award should be made since the workmen's compensation act precluded an employee whose injury was caused by his "intentional wilful negligence." The court rejected this contention, holding: The word "wilful" in the statute means deliberate act; conduct evidencing reckless indifferences to safety. The automatic act of an inveterate smoker in lighting his pipe is without the volition essential to a wilful act of negligence, within the meaning of the workmen's compensation law. It has long been the policy of the court to give a liberal construction to the workmen's compensation law, so that its beneficent purposes may not be thwarted by technical refinement of interpretation.

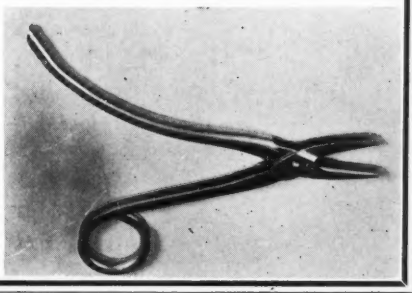
Moise vs. Fruit Dispatch Co. (Nebraska) 283 N.W. 495 (January, 1939)

Cement Industry Makes Gains

The Portland Cement Association reports a 40 per cent reduction in accidents, a 37 per cent reduction in fatalities and a 20 per cent reduction in lost time, during the first ten months of 1938.

SAFETY TONGS *for* **PUNCH PRESS FEEDING**

They speed the job and save the fingers. Their light weight and ease of operation make for day-long comfort in use.



THE BOYER-CAMPBELL CO.

640 St. Antoine St. Detroit, Mich.

New Produc

Additional information and descriptive literature on any of the products mentioned in this service department may be obtained by writing Dept. N, OCCUPATIONAL HAZARDS & SAFETY, *812 Huron Road, Cleveland, Ohio.*

SOAP DISPENSER

A new type of powdered soap dispenser has been introduced by G. H. Packwood Manufacturing Co. Known as the soap-economizer, the manufacturer claims many new features for this product. The dispenser has a positive feed control. By the adjustment of one screw the dispenser may be set to dispense as much or as little soap as desired. The product is manufactured of ebony-black plastic, polished to a mirror finish, flashed with red and chromium.

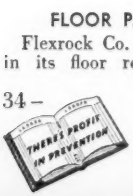
FLOOR PATCHING MATERIAL

Flexrock Co. announces an improvement in its floor resurfacing material. Montmorillonite, chemically composed of manganese, silica, alumina and iron, is added to the material for the purpose of increasing the coverage capacity. It is claimed that the addition of this new element will make it easier to mix the resurfacing material with cement, sand and stone, and will increase the wearing qualities.

HELMETS AND HAND SHIELDS

Four new welding helmets and four new hand shields have just been announced by the American Optical Company. These helmets and hand shields are made of the best grade vulcanized fiber, in either fabricated or one-piece construction, and are designed for comfort, safety, convenience and durability.

The helmets have a new free-floating headgear and an outside friction joint as standard equipment. Three types of glass

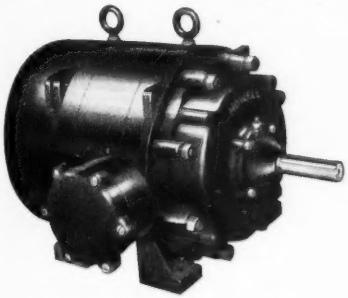


IN THE FIELD

Statements made in connection with any product mentioned in this service department are based on manufacturers' claims. Although these claims are believed to be true, this magazine does not guarantee that to be the case.

holders are available; Deep-Drawn Leakproof Steel, Improved Bakelite, and the new Dowmetal Lift Front, all of which assure maximum protection for welding plates and cover glass. An exclusive feature will be noted in these holders: they hold the welding and cover glass in position flexibly, not rigidly, in order to cushion the shock if accidentally struck. Glass can be easily changed without smudging or risk of breaking.

The hand shields are compact, lightweight, and well-balanced. Corrugated fiber handle, of new design, is deeply grooved to insure a firm, positive grip.



EXPLOSION-PROOF MOTOR

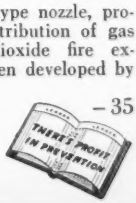
Designed for operation in locations where inflammable liquids and gases are manufactured, or stored, the Howell Electric Motors Co. announces a new line of explosion-proof motors up to 40 horse power. Motors are totally enclosed, and tested to withstand an explosion of an inflammable substance inside the motor, and prevent flames produced by any such explosion from reaching the surrounding atmosphere. Heat capacity is claimed to be great enough to prevent motors from reaching high enough temperature to ignite surrounding gases. Motors carry the Underwriters' Laboratories Inspection Label, and are approved for all Class 1, Group D locations.

NEW FUSE FOR SAFETY

Trico Fuse Mfg. Co. announces a new Thermal Time-Lag fuse designed to hold starting and monetary overloads, and at the same time give safe protection on prolonged overloads. In short circuits the fuse operates just like an ordinary fuse. Some of the features announced for this new fuse are: color indicator for all popular sizes; all-porcelain shock and vent-proof top; flag indicator when blown; and a flat releasing spring to give maximum travel in opening arc when blown. Carries approval of Underwriters' Laboratories, Inc.

NEW FIRE EXTINGUISHER NOZZLE

A new C-O-Two baffle type nozzle, providing a non-turbulent distribution of gas from C-O-Two carbon dioxide fire extinguishing systems has been developed by



the C-O-Two Fire Equipment Co. This new style nozzle is designed to reduce the velocity and pressure of the discharge and permit rapid expansion and non-violent penetration of the gas throughout the entire protected area. Does not require a protruding horn or metal enclosure.

NEW FACE SHIELDS

Three new face shields for light duty protection have just been announced by the American Optical Co. These new shields are not designed to replace goggle protection, according to the manufacturer, but are for light duty operations. Some of the features announced for the shields are light weight, comfort and compactness. Shields may be thrown up when not in use, being held in place by a frictional joint.

Windows are made of durable, transparent material, measuring 4" x 9". An aluminum binding strip is designed to give the shield rigidity and to permit shaping for large features. Headbands are adjustable. Available in clear, amber or green windows.

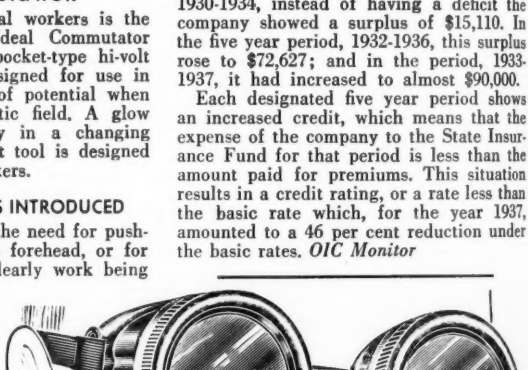
HI-VOLTAGE INDICATOR

Of interest to electrical workers is the announcement of the Ideal Commutator Dresser Co. of a new pocket-type hi-volt indicator. Product is designed for use in indicating the presence of potential when held in a changing static field. A glow tube lights up instantly in a changing static field. This compact tool is designed to protect electrical workers.

TWIN-VIEW GOGGLES INTRODUCED

Designed to eliminate the need for pushing goggles up onto the forehead, or for removing them, to see clearly work being performed, a new type Twin-View goggle is announced by the Chicago Eye Shield Co.

In place of the usual single colored lens, each eye piece contains a colored lens, and a clear glass in the lower part. While work is actually being performed, the wearer's vision is through the colored lens. To get a clear view of the work, the wearer need only tip his head slightly to see through the clear glass. The clear glass is placed behind a light weight, black aluminum visor, which extends over the clear glass at a ninety degree angle. This visor prevents the light rays from reaching the eye through the clear glass while work is in operation. Offering the usual protection from light rays, the Twin-View goggle has the added advantage of saving the wearer the time and trouble of removing his goggles when it is necessary to get a clear view of his work.



Prevention Effects Saving in Insurance Payments

The all time cost experience record of the Columbus and Southern Ohio Electric Co. shows concretely that it is possible to make a profit through organized safety.

The experience of the company on accident claims prior to January 1, 1930, indicated that compensation payments were $163,235 in excess of premiums paid for workmen's compensation insurance—that amount being marked up as a deficit against the company. Prior to January 1, 1933 the deficit was $246,466. In the five year period, 1930-1934, instead of having a deficit the company showed a surplus of $15,110. In the five year period, 1932-1936, this surplus rose to $72,627; and in the period, 1933-1937, it had increased to almost $90,000.

Each designated five year period shows an increased credit, which means that the expense of the company to the State Insurance Fund for that period is less than the amount paid for premiums. This situation results in a credit rating, or a rate less than the basic rate which, for the year 1937, amounted to a 46 per cent reduction under the basic rates. *OIC Monitor*

HOUSEKEEPING HINTS

[*Continued from page 13*]

This plant's modernized lighting system coincidentally increased production, reduced manufacturing mistakes and inspection rejections and enhanced employee morale.

Cardboard or wooden waste containers present dangerous fire hazards. This is especially true if waste materials being deposited in them are oily, or are saturated with inflammable and combustible materials. Insurance regulations today encourage the use of metal containers, preferably those with self-closing lids.

Paper receptacles, which can be burned at the close of the day, are more healthful than metal cuspidors or the "sawdust boxes." Placing these receptacles around machinery, benches and other places is a growing "good housekeeping" practice.

Replacing tools and equipment in their proper storage spaces assures their being found when needed, and also helps keep the workroom neat and clean. Foremen should be responsible for this and other "good housekeeping" practices.

MATTERS OF SANITATION

[*Continued from page 24*]

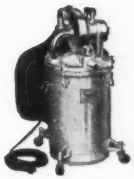
designated employees. The cleaning should be done at regular and frequent intervals without placing too great a reliance on disinfectants as cleasing agents. Soap, hot water, and fresh air are definitely conducive to a sanitary condition as well as an incentive to employee satisfaction and loyalty. Any employee who is required to leave his shop covered with smoke, grime, and perspiration is in a condition offensive to the public with whom he must mingle and he is potentially endangering his own health and well-being.

Effects of lighting, heat, ventilation, and sanitation in places of employment on the health and well-being of the employee is receiving major consideration. Undoubtedly these reports will form much of the ground work for the writing of codes and laws applicable to industry for the protection of the health of employees.

PROTECT
Men, Materials and Machines
with a TORNADO
Portable Industrial
Vacuum Cleaner

"The Tornado method is the only way to clean without making conditions hazardous to the health of workmen," says a prominent battery manufacturer. "Also, salvage alone has paid for the machine many times over."

Real portability — tremendous power—low cost. Write for catalog and trial offer.



Breuer Electric Mfg. Co.
5102 N. Ravenswood Ave., Chicago, Ill.

WITH THE BAREST WARNING

[*Continued from page 31*]

cases have been rare in our organization. Prior to that it was not at all unusual for a considerable number of heat exhaustion cases to occur during the hot months of the year.

"We do not have statistics on the number of cases that did occur prior to the advent of salt tablets, but we do subscribe whole-heartedly to their use."

R. Emmet Kelly, M.D.
Medical Director
Monsanto Chemical Company
St. Louis, Mo.

"The Lehigh Portland Cement Company furnishes salt tablets to all employees during the hot months. Salt has been used at this plant for the last five years. Our records show that there has been no heat sickness during this time. No doubt salt has increased the working efficiency of the men during hot weather."

J. T. Reid, M.D.
Iola, Kansas

Hundreds of other plants have obtained the same results with salt tablets. The preventive measure for heat sickness, in its many forms, is so simple and economical that every industry can, and should, remove this occupational hazard from its plant entirely.

Inasmuch as a certain amount of educational work is necessary among employees who are to be provided with salt tablet protection for the first time, the spring months now offer the best of all times to consummate that work before the period of greatest heat fag and cramp dangers arrive.

BETTER LIGHTING

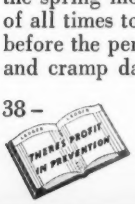
[*Continued from page 22*]

could be used for lighting those operations where the task worked on was of a highly specular nature.

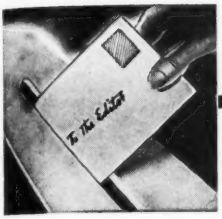
Where supplementary lighting is employed, it is necessary to provide general lighting in order that contrasts will not be too severe. Everyone involuntarily glances away from his work at frequent intervals, usually for momentary relaxation, and unless the entire room is well lighted the contrast will be too great. Instead of being rested, the eyes will rapidly become fatigued. Under usual conditions, a ratio of 10 to 1 in footcandles is generally considered satisfactory, which means that for every 100 footcandles of supplementary lighting, at least 10 footcandles of general lighting should be provided.

While proper lighting can be evaluated on the basis of safety, decreased production costs, spoilage, etc., there are other marginal values of equal or greater significance. As F. A. McDermott, Superintendent of Bastian Bros., states: "The men appreciate the difference between adequate and inadequate lighting. Those who already have improved lighting have expressed their satisfaction with it and those who are working under the old lighting system are impatient to have their section of the plant relighted. This reaction on the part of the factory personnel is highly gratifying to the management—so much so that even if the improved lighting brings us no other tangible benefits, its installation will be considered well worth while because of the improved morale of our employees."

[*Continued on page 40*]



Questions and Answers



Individual answers are given to all questions on industrial health or accident matters. A few of the questions received from readers each month are published for their general interest.

Compensation Court Rulings

How would one go about obtaining results of court rulings on all Workmens' Compensation cases occurring within his state, beginning several years back and continuing as current cases appear, for use in connection with personnel-safety activities in his company?—*H. J. L., Reserve, La.*

A digest of cases which have come before the courts of your state may be secured at any public library of substantial size. Under the heading "Workmens' Compensation" in this digest you will find a list of the cases, with a brief report on the court findings. Also, there will be a reference to the Court Reports, which include the complete text of the court's findings in each case.

With reference to cases which do not reach the courts, it is suggested that you write to the Commissioner of Labor, Louisiana Department of Labor, Baton Rouge, La., for information on compensation claims filed and reports of the hearings.

Scaffolding Safety

I receive your magazine monthly and always look for new ideas in connection with safe practices applying to our field of operation. Recently we had an accident on one of our painter's scaffolds on a tank. As you know, the rope from the block and fall is handled by men on the scaffold and is fastened by them to the scaffold. It is our thought that perhaps you may know of some concern which makes some kind of a safety catch for handling this rope so that it will always be safely fastened. Depending on the human element to fasten this rope securely is not the best practice and, as in our case, if the rope gives way, can result in an accident to the men on the scaffold. We would appreciate any help you may be able to give us on this subject.—*A. S. P., Los Angeles, Calif.*

You are right in stating that depending on the human element to fasten the rope is not the safest practice. Many accidents have been caused from failure to fasten this rope safely and securely. Enclosed is a list of manufacturers to whom it is suggested you write for detailed information on safety catches to fasten this rope.

Handling Zinc Castings

Would you please tell us of the hazards involved in handling, grinding and polishing zinc castings?—*G. F. W., Worcester, Mass.*

There are three general hazards involved in handling, grinding and polishing zinc castings. First, the hazard of flying particles, endangering the eyes of the workers. The preventive measure in this connection is the wearing of goggles and the placing of guards on the grinding wheels. Second, is the hazard of dust and fumes. Zinc dust and fumes are classified as inorganic, toxic and/or irritant, and are hazardous to the respiratory tract. Metal fume fever may result from the handling of zinc castings unless proper preventive and protective measures are taken. Removing the dust and fumes at the source, with exhaust systems and dust and fume collectors, will reduce this hazard. Third, the

irritating effects of zinc dust and fumes may cause a dermatitis condition among workmen. Adequate precaution should be taken to be sure that workers wash thoroughly at the end of each working day, and change to clean clothing frequently. Rubbing protective creams or ointments on exposed parts of the skin is also suggested for protection from skin infections.

Time Elapse in Compensation Case

In the February, 1939, issue of OCCUPATIONAL HAZARDS & SAFETY, you report on an industrial case where the claimant developed pneumonia after being struck on the chest with a rake handle.

We are interested in knowing how much time elapsed between the date the injury occurred and the date pneumonia developed, and whether it was brought out in the hearing to what extent the time lapse affected the award.—*R. J. D., Zanesville, Ohio.*

With reference to the case, McLean vs. Eaton Mfg. Co., in question, we wish to advise you that three or four days elapsed between the date the injury occurred and the date pneumonia developed. In handing down its ruling, the Court did not say anything concerning the period of time. Therefore, it is to be assumed that the time lapse had no bearing on the decision.

Otherwise Perfect Record

TEN years ago James and Oliver Bullamore, brothers and storekeepers in the village of Somers, Wisconsin, rigged up a burglar alarm system. During the past seven years the brothers, aged 79 and 68 respectively, have bagged and sent to prison seven burglars, killed an eighth and maintained a perfect record until one recent night.

On this particular night, the Bullamores followed their usual procedure when the alarm system's gong went off in their home. They switched on a set of Curtis flood lights which they had installed both inside and outside their store, grabbed their guns and rushed the 50 yards to the store. On arrival they found that the lights had frightened the thief into running away empty handed, a fact which would please most storekeepers but seemed to irritate the Bullamores, inasmuch as it was the first mark against their burglar-bagging record.

BETTER LIGHTING

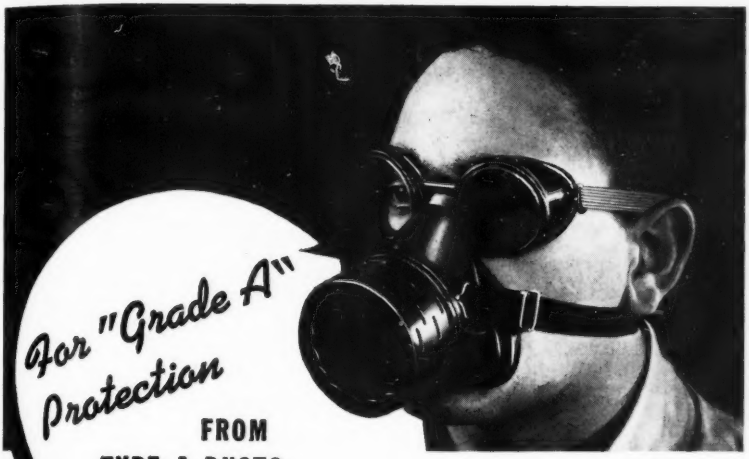
[*Continued from page 38*]

Maintenance and Housekeeping

To have the most efficient and economical illumination at all times requires proper maintenance following the original installation of the correct equipment. Empty sockets, low voltage, dirty walls and ceilings and dirty reflectors are costly items. They are poor housekeeping practices which increase illuminating costs unnecessarily. The cost of maintaining lighting equipment in proper condition is small. In most cases soap and water will do the job. Reflectors, bulbs and other equipment will get dusty and dirty. And the presence of dust on the reflectors, bulbs or globes will decrease materially the illuminating power of the lamp. For example, in a machine shop a diffuser produced 12 footcandles of light when new. When tested in three weeks it was found that it showed only 4 footcandles illumination. Washing the unit raised the lighting power almost to its original level. Institution of regular cleaning of light bulbs and reflectors or diffusers as a feature of a good housekeeping program has cut lighting bills by 20 to 30 per cent.

The A B C's of illuminating efficiency are:

1. Keep bulbs, globes, and reflectors clean.
2. Keep walls and ceilings clean and painted.
3. Use lamp bulbs of good quality and high efficiency.
4. Check regularly for burn-outs and keep sockets filled with good bulbs.
5. Use the proper combination of bulbs and reflectors.



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Here is "Grade-A" protection from Type A Dusts. Multi-baffle cartridge provides exceptionally large *effective* filter-area. New design of inhalation valve assures easy intake of breath. And twin exhalation valves assure positive expulsion of vitiated air, even when wearer's head is down. They can't stay open, fill with moisture or freeze.

Features like these mean comfortable breathing all day long. And there are many other safety and comfort features of the American R1000 Respirator. Write for Bulletin TL119.

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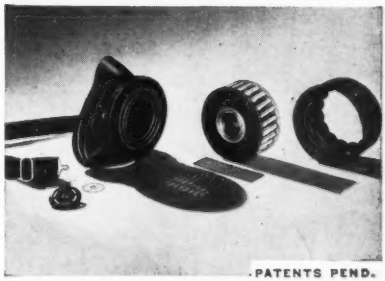

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Everything for First Aid, including Kits and Type D unit refills.

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Protection against poisonous and combustible gas hazards, in many types.

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